Zero Retries issue 0097 2023-05-05

Zero Retries is an independent newsletter promoting technological innovation in Amateur Radio, and Amateur Radio as (literally) a license to experiment with radio technology.

New address as of 2023-05-04 - ***www.zeroretries.org***

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

In this issue:

- **Request To Send**
- **Thought Experiment - Neil's Night - Part 1**
- **ZR > BEACON**
    - **Arduino Digital Modes HF QRP Transceiver (ADX-S) Kit**
    - **Turn Island Systems New Products**
    - **AtlasOS - We redesigned Windows for gamers**
    - **ARDC Code of Conduct**
- **Feedback Loop**
- **Join the Fun on Amateur Radio**
- **Closing The Channel**

Web version of this issue - https://www.zeroretries.org/p/zero-retries-0097

Request To Send

By Steve Stroh N8GNJ

www.zeroretries.org is now active!

I finally activated the custom domain for Zero Retries - **www.zeroretries.org**.

As is usually the case with such things, getting this done was a little intimidating, a little frustrating, and the end, pretty easy once I parsed the intent of some poor documentation. I also figured out how to kill the obnoxious "This domain parked free" page when zeroretries.org (without the www.) was used.

The original address for Zero Retries - zeroretries.substack.com now redirects to www.zeroretries.org. Yes, Substack requires the www prefix (subdomain), though typing just zeroretries.org will *probably*[1] redirect to *www*.zeroretries.org.

This, and all future issues of Zero Retries, and all the support pages, are now updated to the new domain (if you spot zeroretries.substack.com, other than in previous issues of Zero Retries, please let me know). Because of the redirect, I won't expend the effort to update previous issues of Zero Retries.

And… yes, I *should* have done this from the beginning of Zero Retries.

Irrational Exuberance Department

The article in this and the next few issues of Zero Retries is another example of one of the maxims of Zero Retries (see About - Relevant and Interesting Quotes)

> **Nothing great has ever been accomplished without irrational exuberance.**
> Tom Evslin
>
> Irrational exuberance is pretty much the business model of Zero Retries Newsletter.
> Steve Stroh N8GNJ

As my quote, referencing Evslin indicates, that key insight helped inspire me to start Zero Retries. It *is* a bit *irrational* to start something like Zero Retries that has no substantive business model. A newsletter by a solo writer, with little independent business experience, discussing a niche (technological innovation) of a niche (Amateur Radio)? But, the *exuberance* part was that I *really* wanted to be able to read (and discuss[2]) such things, and such a publication didn't exist. So, with a healthy dose of "irrational exuberance (and a blessing from Evslin when I thanked him) I launched Zero Retries nearly two years ago.

“Irrational Exuberance” isn’t just the business model of Zero Retries, it’s the courage to publish speculative ideas that aren’t mainstream, such as Exploring the Idea of a Geostationary Amateur Radio Satellite for the Western Hemisphere (Zero Retries 0012) and A Vision for Zero Retries Interesting Amateur Radio In 2029 (Zero Retries 0079).

And so it was that my latest speculative idea for Amateur Radio - “Neil’s Night” - took over my writing time for several days this week. Very quickly the *Post too long for email* banner appeared, but I kept writing as I hadn’t finished capturing all of the relevant points of the idea. After the article was mostly complete, I agreed with the banner - the article (as originally written) *is* too long for email, by at least half, plus a follow-on article about a typical (imaginary) “Neil’s Night” experience. Thus “Neil’s Night” will be serialized over least the next three issues of Zero Retries.

Once again, thanks for following along in this experiment-continually-in-progress that is Zero Retries.

MicroHAMS Digital Conference 2023 *Apparently Canceled*

I went to the MicroHAMS Digital Conference website to check on some details on MHDC 2023 scheduled for this Saturday 2023-05-06 and there is now no mention of the 2023 event… apparently it was quietly canceled. *I’m bummed*. I’ll post the slide deck for my MHDC 2023 presentation in the near future.

/ Steve N8GNJ

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Thought Experiment - Neil’s Night - Part 1

By Steve Stroh N8GNJ

One of my most profound joys is to have conversations with people much brighter, more experienced, and more talented than I am. Such conversations often lodge in my mind for a time, and are brought forward by other conversations or experiences in a synthesis of combined thoughts. This idea / story is an example of that.

This is a thought experiment (a specialty of Zero Retries, where I air out, rather than self-censor some of my "irrationally exuberant" ideas3) about creating an annual event on July 20th to:

- *Commemorate, via Amateur Radio, the anniversary of humanity’s first steps on the Moon in 1969;*
- *Encourage Amateur Radio Earth Moon Earth - EME (“Moonbounce”) communications especially to those that haven’t tried it;*
- *Expose the fun of Amateur Radio to the public and especially techies (hopefully, young techies) by staying up late on a summer evening pointing antennas (and computers) at the Moon.*

EME Background

For those unfamiliar with EME operation… *EME is tough*. Not only is the round trip path of one’s radio signal nearly a half-million miles (769 kilometers), but the Moon is a lousy, lossy barely-a-reflector for radio signals. Combining the path loss and the very low reflectivity of the Moon makes it amazing that it’s possible to do EME *at all*. For those interested in the history of EME, I recommend the Project Diana Wikipedia page, the book To the Moon and Back: The Life and Times of Project Diana, and the original site of Project Diana that was operated by an Amateur Radio club (but that no longer seems to be the case per the club’s current website).

My Interest in EME

I’ve been interested in EME since shortly after becoming an Amateur Radio Operator in the mid-1980s. An Amateur Radio friend took me along to a visit to an Amateur Radio friend of his who enjoyed EME. The EME operator was a farmer who, of course, was busy farming during the summer, but had ample time available in the winter - his “tinkering” time. The EME operator had an impressive antenna array of either yagi beams or circularly polarized antennas. The part I remember vividly about the EME operator was that his array was built on a frame at ground level (he was also a good welder) and the method he used to aim his array as the Moon changed position in the sky was to use a hydraulic system that used the Power Take Off (PTO) capability of one of his tractors.

At that time, having an EME station was rare in Amateur Radio because it required high transmit power (1000 watts on VHF or UHF), an antenna array (or large dish antenna), and sensitive receivers (often putting receiver preamplifiers right at the base of the antenna to minimize feedline loss of the very weak signals). Plus one needed to understand the physics of EME, knowing what the schedules were for other EME operators, frequencies, modes, etc. And patience… *lots* of patience.

Fast forward two decades from my initial encounter with EME to the 2005 release of the WSJT-X suite of weak signal modes. My admiration for (Nobel Prize Laureate) Joe Taylor K1JT is beyond the scope of this article, but this video is a good introduction to the WSJT-X suite of modes by K1JT himself. Suffice it to say that K1JT applied his *considerable* expertise in signal processing of radio signals to some common situations in Amateur Radio, and created an entirely new class of data modes, including JT4 and JT65 for EME. JT4 and JT65 enabled a modest (comparatively, vs the traditional EME station) Amateur Radio station (11 element beam, 100 watts power) to reliably work EME. JT4 and JT65 opened up the possibility of EME operation to many more Amateur Radio Operators. I include myself in this category as building a “conventional” EME station (such as the farmer’s EME station) isn’t a reasonable possibility for me, but a “JT4 / JT65” EME station is possible for me.

My Very Bright Friend

The idea for “Neil’s Night” really begins that I’m friends with an Amateur Radio Operator who is a *very* bright and talented engineer who is involved in the radio technology industry. I’m not in good enough touch with my friend to discuss their part in this story, thus I’m keeping my friend’s details vague.

My friend enjoys putting their considerable radio technology (and software) talents to use in personal Amateur Radio projects. Because my friend’s

capabilities are *so* far ahead of most Amateur Radio Operators (and Amateur Radio in general), my friend generally keeps their projects to themselves except for a few confidants. Simply put, my friend wants to *enjoy* their Amateur Radio activities, not put their project out into public and open themselves up to providing defacto technical support. I don't blame my friend for this perspective - such a defacto technical support burden *has happened* to a number of folks who've "made public" projects of similar scope. Thus my friend works on their Amateur Radio projects in stealth mode.

My friend has gotten interested in doing Earth Moon Earth (EME) communications and has put together their own unique EME system. (From memory…) my friend's EME system automatically aims the antenna and tracks the progression of the Moon across the sky, and uses their own variant of the open source JT4 and/or JT65 protocols for EME communication. In our last conversation (more than a year ago) about their EME system, my friend's system was receiving EME transmissions from the Moon and they were confident that milestone meant that their concept was sound and EME transmit capability would likely succeed with a bit more development.

My friend's EME system rekindled my latent interest in possibly doing my own EME system.

EME Receive-only

Despite the profoundly sad loss of the Arecibo dish in Puerto Rico which once was used for Amateur Radio EME communications, there are a number of large dish antennas accessible to Amateur Radio Operators for EME communications. One of them is "The Big Dish" at W1MX, the MIT Amateur Radio station in Cambridge, Massachusetts. Another one is an even bigger dish on the original site of Project Diana (mentioned above).

Large dish antennas such as these can focus transmit power, and receive weak signals much, much better than a modest "JT4 / JT65" Amateur Radio station. If a dish antenna such as these "big dishes" are in operation, working EME for the average Amateur Radio Operator is a lot more feasible… and a lot more *fun*. The "big dishes" also enable (I think…) *receive-only* EME which, of course, doesn't require an Amateur Radio license. That's a key aspect of "Neil's Night", and more on that later in this article.

The key to such a scenario is to arrange schedules[4] with those large dish antennas. What if there was an annual event for "show off to the public" EME operation on, say, each July 20th, the anniversary of humanity's first steps on the Moon?

To be continued in Zero Retries 0098, scheduled for publication 2023-05-12.

Update - Neil's Night - Part 2

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ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

Arduino Digital Modes HF QRP Transceiver (ADX-S) Kit

Barb Asuroglu WB2CBA is the creator of the ADX - ADX-GitHub page.

> The [Arduino Digital Xceiver] ADX is a mono band (actually quad band) digital modes optimized HF transceiver that can cover four pre-programmed bands one band at a time by swapping Band LPF Modules. It can work on 80m, 40m, 30m,20m, 17m, 15m and 10m bands and can operate on four of the most popular digital modes, FT8, FT4, JS8call and WSPR.

With WB2CBA's encouragement, Adam Rong BD6CR decided to create a variation of the ADX - the ADX-S - Arduino Digital Modes Transceiver - From Open Source Project ADX to Kit ADX-S, and eventually a offer a kit.

> I have decided to name the new circuit as ADX-S, where S stands for Superhet.

As a digital-first Amateur Radio Operator, it's cool to see the emergence of these digital modes High Frequency (HF) low-power radios.

Turn Island Systems New Products

I've previously noted in Zero Retries that there's an unusual concentration of techies on San Juan Island (Friday Harbor), Washington. NW Digital Radio was the first such Zero Retries Interesting company I knew of, and now there's also Turn Island Systems.

Turn Island Systems (TIS) is a new company by Paul Elliott WB6CXC[5] and Steve Roberts N4RVE[6]. The raison d'être of TIS is refreshing:

> We design stuff because we enjoy it, and generally design it because we have a need for some particular function. Sometimes these designs are useful to others, and these are the ones that show up here on the Turn Island Systems website.

The first of TIS' two debut products is the QDX External Clock Reference Interface.

> The QDX digital transceiver from QRP Labs is a brilliant little radio. For most uses, just plug it in and it works. But some digital modes require a bit more frequency stability than the internal TCXO can deliver. For these applications we provide a modification kit that lets you connect an external precision reference clock (typically provided by a GPS Disciplined Oscillator) to the QDX, bypassing the internal 25 MHz oscillator.

Image courtesy of Turn Island Systems

The second TIS debut product is the TIS-1279 Clock Distribution Buffer.

> Why do we need to distribute a clock? And how do do it?
>
> For precise frequency measurement and stability analysis we generally need a frequency reference that is better than the thing we are trying to measure. Although we can use standards such as Rubidium clocks or OCXOs, typically we now use a GPS Disciplined Oscillator (GPSDO). Whatever the source, we often need to send this clock to several pieces of gear. A cheap passive splitter will sometimes suffice when sharing a clock among two or three devices (this depends on the output level of the reference, and the input sensitivity of the device), but a more robust solution is a Clock Distribution Buffer.

TAPR offers some products with similar capabilities, but what strikes me7 about the TIS-1279 is that they went the extra step to put it into a custom *metal* enclosure. That's a unit that you'd be proud to show off in your radio system!

I look forward to future products from Turn Island Systems!

AtlasOS - We redesigned Windows for gamers

> AtlasOS is a transparent and streamlined modification of Windows. Designed to maximize your system's performance and optimize latency.

Mentioned here only because there are a number of Zero Retries Interesting apps such as VARA FM that only run on Windows. Given the significant overhead of telemetry, crapware, and *advertising* that Microsoft has burdened Windows with of late, it's a frustrating experience when you just want to *use Windows as an underlay* to the app. This is just one of several such approaches.

ARDC Code of Conduct

Mentioned in the ARDC 2023-04 Newsletter:

> We are very happy to announce that we have published our Code of Conduct. First, let us thank you for all your input. That, plus a great deal of work by our staff, volunteers and board members, has resulted in a code of conduct that will help ensure that our activities and events are inclusive, productive, and harassment-free. Please take a look and let us know if you have any thoughts or concerns. You can do this by sending email to conduct@ardc.net.

To many, this probably seems like mere Administrivia. I can attest from *personal* sad experience with other organizations (that don't have one) that a formal Code of Conduct is actually a vital element for widespread participation especially by younger folks. In this era, it's just a commonsense approach for organizations such as ARDC to have such "rules of engagement" spelled out in detail so they have the tools necessary to deal effectively and dispassionately with poor behavior. This bodes well for ARDC's future activities and increased participation from current and future generations.

Leave a comment

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Feedback Loop

Comments:

Thank you Ben Kuhn and John Simmons NI0K for commenting on Zero Retries 0096. Greatly appreciated! Thank you NI0K for the kind words about Zero Retries.

If you provide feedback via email, I may excerpt your feedback or include it in full. Unless you specifically grant me permission to include your name, I won't do so. Feedback may be lightly edited for clarity.

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out
Join the Fun on Amateur Radio for some pointers.

Zero Retries Frequently Asked Questions (FAQs) — In development 2023-02.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing ***Thanks*** to:

- Tina Stroh KD7WSF for, well, *everything!*
- **Pseudostaffers** that write about about "Zero Retries Interesting" items on their blogs that I don't spot:
  - Dan Romanchik KB6NU
  - Jeff Davis KE9V
- **Newsletters** that regularly feature Zero Retries Interesting content:
  - Amateur Radio Weekly by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories.
  - Experimental Radio News by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC.
  - TAPR Packet Status Register has been published continuously since 1982.
  - Other Substack Amateur Radio newsletters recommended by Zero Retries.
- **YouTube channels** that regularly feature Zero Retries Interesting content:
  - HB9BLA Wireless by Andreas Spiess HB9BLA
  - KM6LYW Radio by Craig Lamparter KM6LYW (home of the DigiPi project)
  - Modern Ham by Billy Penley KN4MKB
  - Tech Minds by Matthew Miller M0DQW
- The Substack email publishing platform makes Zero Retries possible. I recommend it for publishing newsletters.

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click below to join ~~100~~ ~~200~~ ~~300~~ ~~400~~ *500* ~~600~~ ~~700~~ *800+* other readers:

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Leave a comment

If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

Zero Retries (N8GNJ) is on Mastodon — n8gnj@mastodon.radio — just click:

Zero Retries / N8GNJ on Mastodon

Email issues of Zero Retries are "instrumented" by Substack to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog — *Discussing new generations of Amateur Radio Data Communications — beyond Packet Radio (a precursor to Zero Retries)*
- N8GNJ blog — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs — Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ / WRPS598 (He / Him / His)
These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham (The City of Subdued Excitement), Washington, USA.

2023-05-05

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Blanket permission granted for TAPR to use any Steve Stroh content for the TAPR Packet Status Register (PSR) newsletter (I *owe* them from *way* back).

1

I have a few browsers, including Chrome, on which zeroretries.org does *not* automagically redirect to www.zeroretries.org. I haven't yet figured out why. For those with deep DNS experience, the CNAME of www is required to point at a special Substack URL.

2

The "discuss" part is still a bit slow-going, but it's improving.

3

Especially, like this one, for promoting Amateur Radio as a license to experiment with radio technology.

4

Yes, I'm aware of the ARRL EME Contest, but as I'll discuss later in the article, "Neil's Night" isn't quite compatible with the EME Contest.

5

I also recommend WB6CXC's blog - wb6cxc.com - it's Zero Retries Interesting!

6

Yes, *that* Steve Roberts - see Nomadic Research Labs.

7

I really should get over my continual surprises of just *how much a talented individual(s) can accomplish* in offering unique products such as the TIS-1279 by leveraging contract manufacturers willing to make custom assemblies in small quantities.